ISSD NEWSLETTER

Volume I Number 4 July 1988

Note From the Editor:

We have recently passed an important milestone in the evolution of our society; we now have one hundred members! The one hundredth member is Hans Zwoferink of Rijssen, Holland; he is a real lover of "Gifkikkers". Hans currently is editor of **Paluterra**, official publication of a Dutch reptile and amphibian society. In a recent communication, Hans has informed me of the formation of the **Nederlandse Doelgroep Dendrobatidae** (Dutch Dendrobatid Society). He will serve that society as newsletter editor and society treasurer. January 1989 is the target date for publication of the first newsletter and subsequent editions will appear every other month thereafter. Foreign membership dues are $15.00 (U.S.) You can find Hans' address in the list of new members at the end of this newsletter. **ISSD** applauds this effort and we hope that a mutually beneficial relationship will develop between our two societies.

We are privileged to have in this edition a fine paper on the husbandry and breeding of *Dendrobates azureus* written by another of our Dutch members, Erik Wevers. This paper was originally written in Dutch and it has required several trips back and forth across the atlantic to get it into the form in which it appears herein. We hope that its Dutch flavor has not been lost in the translation into English. I mention this because I hope that it may encourage others to submit papers for publication. Whatever your needs are, relative to publishing in English, we can find a way to meet them! Our next newsletter will feature *Dendrobates histrionicus* and *Dendrobates lehmanni*. Material for Volume I, number 5 is **badly** needed so please send in your manuscripts as soon as possible.

The first annual meeting of the **ISSD** was held in conjunction with the 12th International Symposium on Husbandry and Captive Propagation of Reptiles and Amphibians; It was held in Newark New Jersey on June 15th through the 18th. In addition to our society meeting we also sponsored a "Dendrobatid Workshop" which was very well attended. Reports of the meeting as well as the workshop can be found in this newsletter. In consideration of the success of this event, we are tentatively planning to hold our second annual meeting in conjunction with the 13th Symposium next year. The plans are very preliminary at this stage and we are certainly receptive to suggestions for an alternate site; we have no formal affiliation with "The Symposium" and are under no obligation to its sponsors. The 13th Symposium will probably be held in Tucson Arizona next year.

There are many projects among those first proposed (see statement of goals on the inside cover of Volume I, # 2) which are yet to be worked on; For example, the "Breeders Network". On the questionnaires that were returned some of you expressed an interest in working on these. Now that we have society officers, i.e. more people to carry the work load, we hope to see some progress along these lines. Your help may be solicited in the near future.

BE SURE TO TAKE NOTE OF THE NEW LOGO!!!

I would like to call your attention to a controversial proposal currently under study in the U.S. State Department. It concerns the use of a chemical called Spike on Coca fields in South America. Please read over the material on this topic in this and future newsletters very carefully. It is a controversy in which we as a society **need** to get involved.

De blauwe gifkikker (*Dendrobates azureus*) in het terrarium

(The Blue Poison-Arrow Frog in the Terrarium)

Abstract:

Men vindt *Dendrobates azureus* in savanne streken in Zuid-Surinam, in een paar geisoleerde bosresten. Ze bereiken een lengte van +/- 45mm. Vrouwtjes zyn onderling aggressief. Gedurende de zomer wordt voornamelyk weid plankton ge voerd. In de winter voerdt men Drosophila's. Winters worden vitamine gevoerd, aan de Drosophila's. Ze leggen 2 tot 6 eieren, deze worden in het terrarium gelaten tot ze uit komen en daarna opgekweekt by +/- 22° C. Jk voer ze met vissenvoer, en na 3 maand zyn het kikkerdjes.

Introduction:

Dendrobates azureus, described by Hoogmoed in 1969, excites many of us. This much coveted species is rare in captivity. Breeding and raising these frogs proceeds very slowly.

Origin:

This beautiful poisonous frog originates in Surinam and is known only from some very specific isolated forest islands on the Sipaliwini-savannah; at an elevation of 315 -430 meters. *Dendrobates azureus* is found only in one specific creek valley, littered by huge boulders. The frog lives between these smooth, moss covered boulders (Hoogmoed, 1971).

Why this particular microhabitat is required is unknown to me; in my terraria the frogs seem to do just fine, with or without the rocks. Possibly there are some special food items inhabiting these rocks, or there are some particularly favorable egg deposition sites within these rocks. The temperature ranges between 27 - 32° C by day, falling to about 20° C at night, in the natural habitat.

Appearance:

D. azureus has a smooth skin. Sometimes it is said that the abdomen and the inside of the thighs have a granular texture; I have not observed this on my animals. The primary color

is black. the body is covered with a pattern of blue spots, sometimes so close together that the appearance is actually that of black spots on a blue background. The pattern of the markings is not consistent; I have some animals that are almost completely blue while others have rather large areas of black. The ventral surface is a very dark blue, almost blue-black. *D. azureus* is one of the largest of the poisonous frogs. The females are larger than the males, about 45mm (SVL); they are usually quite plump. The males grow to about 38mm (SVL). In most cases the males can be recognized by their relatively larger front feet toe pads.

TERRARIA:

My terrarium measures 125 x 80 x 90cm (LxWxH). It is sealed water tight and there is about 5cm of water filling it. On the bottom I have created a land area from stones, sticks and soil. In addition, it has an active waterfall. The water is not heated and averages about 20° C. The terrarium is ventilated. On cold nights the air temperature drops to about 15° C and it rises to a high of about 35° C on sunny days. The terrarium receives sun from a south window. Early each morning I sprinkle the terrarium with either rain or tap water. The tank is densely planted with epiphytes, ferns, Hoyas, etc. Marshy plants grow in the saturated soil.

Two males and one female occupy each terrarium, I prefer to keep only one species of frog per terrarium. Some spiders live in the terrarium, feeding on the insects with which I feed my frogs. The offspring of the spiders serve as a food supplement for the *D. azureus*. In my hobby room I have tanks especially for keeping young frogs, these measure 75 x 55 x 70cm. These terraria are arranged in the same manner as the one mentioned above, except there are no waterfalls. The bottoms are constructed with a slope so that there are areas where the soil is dry. Each rearing tank is home to two pairs of frogs; except that with some species (for example *D. pumilio*) their behavior dictates that only one male may be kept in each tank.

BEHAVIOR:

D. azureus are very active, especially after the sprinkling of water and during the feeding time. It is mentioned in some literature that the females are quite aggressive (Polder, 1973), my observations confirm this. The males are also aggressive. I have observed

them jumping through the terrarium fighting with each other. Sometimes they jump from the waterfall into the water, continuing their fight in the water. They jump onto each others necks, trying to get their feet over the others head, pushing their opponent flat to the ground. They then use their hind legs for balance, pressing more forcefully on their adversary. I have observed them fighting for hours, until one or both are exhausted; then, five minutes later, they will be catching fruitflies side by side! This all happens while the female looks on. Because of their large size and this lively behavior, they need a good size habitat. Their croaking is inconspicuous; the sound being rather like that of *D. tinctorius*. It is in their nature for two frogs to go after the same food insect; it appears as if there is some envy when one is feeding. *D. tinctorius* displays this same behavior. I feed them with only small quantities of insects at any one time; in their feeding frenzy they trample much of the food and it seems that the more food there is available, the more difficulty they have deciding which fly to go after.

FOOD:

It is not sufficient to feed *D. azureus* solely with fruitflies. I gather pasture plankton. For example; caterpillars (15mm long), spiders, arthropods etc.. The frogs will eat everything. Reproductive activity is linked with the quantity of food available. In the winter time I feed them fruitflies and I get two to four eggs once every week or once every other week. In the summer, when plankton is available, I get three to five eggs two times per week. It is true what is often said, that raising these frogs is dependent in the first instance on the food. I supplement their feedings with Osspulvit, using it more in the winter than in the summer, when plankton is available. Even my young stock are fed as much as possible with the plankton. I screen the plankton to select small insects. This process is a lot of work but it results in larger, and more beautiful frogs. They grow better this way than on a diet of vitaminized fruitflies. Since I have begun this practice, none of my frogs has died. Also, from healthy parents I raise healthy young.

PROPAGATION:

Dendrobates azureus does not produce many eggs. My females produce two to five eggs, depending on the season. *Dendrobates azureus* produces the largest eggs of any of the poisonous frogs. Also the tadpoles are

large; they are larger than those of *D. tinctorius* and even *D. auratus*. It is the male who decides where the eggs will be laid. The eggs may be deposited in a petri dish under a coconut shell, or on a bromiliad leaf. The female cleans the nesting site before she lays her eggs. Next, or sometimes during the laying of the eggs if there is enough room, the male fertilizes the eggs. Sometimes a second male will fertilize the eggs, sometimes both simultaneously. I leave the eggs in the terrarium until the larvae are almost ready to emerge from the eggs. I do this because the males water and clean the eggs every other day. I have found that if I remove the eggs right away, often they will mold. This molding can be prevented by sprinkling them with a solution of one drop of SH 2000 per liter of water. My experience with clutches in which some of the eggs have gotten moldy is that the healthy eggs remain unaffected. The tadpoles are cared for in a tank with thirty separate compartments connected in such a way that the tadpoles cannot congregate. The water is circulated through a biological filter beneath the tadpole compartments. The water temperature is maintained at about 22° C. I avoid higher temperatures because this leads to a faster rate of development, which results in early metamorphosis. Frogs which metamorphosize early, at a small size, will remain small the rest of their lives. I feed the tadpoles Tetra Micromin daily and sometimes crushed snails. Also, in the first few days after the eggs hatch, I feed the tadpoles Liquifry Red and Green. The larvae grow nicely on this diet so I do not use any other types of food. The incubation period from fresh egg to free swimming tadpoles is about sixteen to eighteen days. Large larvae measure about 2cm long. The development of the larvae from time of hatching to metamorphosis takes about three months and the tadpoles reach an average size of about 18mm. The tadpoles are cannibalistic. They do not shun the light, as do the larvae of *D. parvulus*, and they do not seem to be disturbed by tapping the container or by loud noises. When the front legs emerge the larvae are removed to a plastic container with shallow water and a plastic lid onto which they can climb. Next, when the tail is completely reabsorbed, they are placed in containers measuring 40 x 20 x 30cm. In these I have placed peat moss and leaves and a water dish. The temperature is kept at 22° C and the humidity maintained as high as possible. After a few weeks I raise the temperature to about 25° C. The

froglets are fed arthropods, fruit flies and young spiders. The froglets quickly adjust to their new environment, claiming their permanent place in a bromiliad, behind a fern or under a leaf.

MORE DETAILS:

It is likely that *Dendrobates azureus* is related to *Dendrobates tinctorius*. It is possible to cross breed *D. azureus* with both *D. auratus* and *D. tinctorius* but because the blue poisonous frog is so rare this practice should be discouraged, rather the genetic line should be kept pure! These species show similar behavior in their natural habitat, the males transporting the larvae. In my terraria, this behavior has not been exhibited. It is possible that, as a result of the removal of the eggs, they lose their natural instinct. When available the blue poisonous frog is easy to raise and to keep, however we need to maintain caution because import has now been made impossible. This species is now listed as endangered and is possibly threatened with extinction. At the present time all the poisonous frogs are listed as endangered (CITES - Appendix II).

LITERATURE:

HOOGMOED, M.S., 1971. *Dendrobates*, een kleurrijk genus. Het Aquarium 41 (8):182-189.

POLDER, W.N., **1973.** Over verzorging en voortplanting in gevangenschap van *Dendrobates azureus* en enkele andere *Dendrobatidae.* Het Aquarium 44(1):16-22.

ACKNOWLEDGEMENT:

A special note of thanks to Mrs. Thea VanderWel, of Janesville, Wisconsin for translating this paper from Dutch into English.

COMMENDATION

A special note of thanks and commendation to Jack K. Frenkel, M.D., of Kansas City for collecting, and successfully returning to the U.S. from Panama, a color form of D. auratus rarely seen in American collections. The frogs are rather more slender in body than other races of auratus, with long delicate toes. The body is entirely black with just a few very small brilliant green spots scattered over the dorsum and legs. This is a valuable contribution to the auratus captive gene pool. We are especially pleased that Dr. Frenkel chose to distribute these animals to experienced breeders to maximize the chances of establishing a breeding captive population.

Report - First Annual Meeting

On June 18th 1988, the first Annual Meeting of the **ISSD** was held in Newark, New Jersey. It lasted approximately two hours and was attended by fifteen members. Considering the fact that **ISSD** draws its membership from Europe, South America and North America, it was a very good turn out.

The first order of business was ratification of the new constitution and Bylaws. Most of those members present had already voted via the mail ballot vote; those which had not were unanimous in their approval on a voice vote. Similarly, all the mail ballots which had been returned contained yes votes. The constitution and bylaws were approved post-haste. Because of the need to proceed with the organization of the society governing body, and a desire to have officers in place this year, we decided to "appoint" officers to fill the various offices on an interim basis. Sometime prior to the second Annual Meeting in 1989 we will hold elections according to the rules established in the Constitution and Bylaws. David Hulmes will hold the office of President; Ed Tunstall, the office of Secretary-Treasurer; Anthony Wisnieski, the office of Director-North America; Eric Wevers, the office of Director-at-Large; And, Dale Bertram, the office of Editor of the Newsletter. An appointment to the office of Director-Europe was made but it requires approval of the person named, correspondence concerning which has not yet been received at the time of this publication.

With this "business" out of the way we got into a question and answer session which pointed out that we all have experienced similar problems, like "spindly-leg syndrome". We also discussed a possible field trip to Peru next summer.

The meeting concluded on a very positive note and the next meeting has been tentatively scheduled for June or July of 1989 in Tucson, Arizona.

One other topic of interest warrants mention; Ed Oshaben was able to video tape the Dendrobatid Husbandry Workshop presented by Dr. Bertram. Details of acquiring a copy of the tape are mentioned elsewhere in this newsletter.

Respectfully,

Ed Tunstall

A Successful Symposium !!

By Ed Oshaben

The 12th International Herpetological Symposium on Captive Propagation and Husbandry was held in the New York-Newark metropolitan area June 15th through the 18th. It was attended by some 220 individuals.

The schedule of events included six workshops, one of which was entitled "Dendrobatid Frogs - A Workshop". This workshop was sponsored by **ISSD** and was chaired by Dale Bertram, founder of the **ISSD** and editor of its newsletter.

A tremendous wealth of information on dendrobatid frogs was exchanged during the workshop and the question and answer period that followed. Dr. Bertram's presentation contained four basic themes dealing with the keeping and breeding of dendrobatid frogs. The first was that there were many "misconceptions" about the keeping of these frogs among hobbyists. Some of these include: "Dendrobatids are very delicate animals"; "Only experts can get these animals to breed"; "It is nearly impossible to obtain good healthy specimens"; "Dendrobatids do not ship well"; Dendrobatids are endangered by over collection and habitat destruction and therefore trafficking in them should be discouraged-this fact is supported by their recent addition to Appendix II of CITES"; "No good HOW-TO books on their care are available". Dr. Bertram discussed why each of these inaccurate "misconceptions" hinders people from seriously considering keeping and breeding these animals. The next basic theme discussed was the poor availability and high price of specimens. A few general ideas were presented to help deal with this problem in the future. The third basic theme concerned how the word-of-mouth spread of "initial bad experiences on the part of novice collectors" creates myths about the difficulties of working with dendrobatids. The last basic theme concerned the "Lack of knowledge of the principles of husbandry and breeding" that seems to exist in the herpetological community at-large. Some basic "how to

get started" concepts were presented.

Topics discussed by the workshop attendees during the question and answer period were vast and varied but I will attempt to provide a list of them:

1. Alternative food sources such as termites, cockroaches, springtails, grain moth larvae, aphids, fly maggots, palmetto bugs and pasture plankton.
2. Nutritional supplements - pros and cons.
3. Mixing different species in community terrariums.
4. Adding new specimens to an established colony.
5. Crossbreeding of species.
6. Toxin production (or lack thereof) in captive bred specimens.
7. Worm infestations.
8. Stimulation of breeding activity in reluctant colonies.
9. Treatment of Spindly Leg Syndrome.
10. Treatment of Nose Rot.
11. Longevity and reproductive viability.
12. Species currently being kept and bred in captivity.
13. Adaptation to captivity.
14. Types of plants used in terrariums.
15. Frequency of tank cleaning and alternatives.
16. Breeding set-ups.
17. Breeding and other types of calls of dendrobatids.
18. Hatching and rearing CB frogs, in-tank vs. out.
19. Tadpole diet alternatives.
20. Water quality and its effect on tadpole rearing.

In addition to the six workshops, papers were also presented on twenty additional herp related subjects including one by James H. Marlett (an **ISSD** member) of the Sedgewick County Zoo in Wichita, Kansas entitled "An Update on Spindly Leg Syndrome in Frogs". Two papers presented that are of interest to amphibian keepers were "Husbandry and Breeding of *Agalychnis callidryas* (Red-Eyed Tree Frog) at the National Zoo, with Notes on the Effects of Filtration Devices on Rearing Tadpoles", by Cecilia Chang of the Smithsonian Institution

and "Breeding the European Fire, *Salamandra salamandra*", by John Brunner, a private breeder from Montrose, Pennsylvania.

Private viewing of the Bronx Zoo's Jungle World and Reptile World, the Staten Island Zoo's Reptile and Aquarium building and a visit to the American Museum of Natural History also highlighted the four day symposium schedule.

A videotape of the entire Poison Dart Frog workshop, approximately 90 minutes, was made. This includes Dr. Bertram's presentation as well as the question and answer period. Interested parties may obtain a copy of this tape by sending a check for $15.00 (VHS) or $20.00 (BETA or 8mm) to:

Ed Oshaben
10669 Jubilee Drive
Chardon, Ohio 44024

The fee covers the cost of a blank tape, reproduction of the program, postage and handling. This is a non-profit venture offered as a service to **ISSD** members. Our international members should be aware that the tape was recorded on the American NTSC video standard and it will not be compatible with European PAL or SECAM cassette video-recorders.

Classified Ads:

Wanted: Male *Dendrobates histrionicus* (black with orange disc); Male *Phyllobates vittatus*; other species in pairs. May be able to arrange pick up in Europe. Contact: Bob Davies, 5 Richards Road, Standish, Wigan WN6 0QU, England. Phone # 0257-421942.

For Sale: F1 captive bred *Dendrobates auratus*, from wild caught Hawaiian stock. $15.00 each plus shipping . Solid guarantee! Contact: Dale Bertram, One Virginia Terrace, Madison, Wisconsin 53705. Tele # 608-233-1083.

The "Breeders Forum"

In the first few editions of the newsletter the "Breeders Forum" worked very well. I have received numerous compliments about it. I feel that it is an ideal medium for the exchange of ideas. However it cannot work without reader participation; I received no replies to the questions raised in Volume I, number 3. This was a disappointment to me! In the future I hope that our members will take responsibility to see to it that this regularly recurring column does not fade away by sending in both answers to questions that have been raised and new questions.

Hans Zwoferink has made some observations in his breeding of *Dendrobates quinquevittatus* that have raised some questions, he asks: "How is it possible that from the eggs of *Dendrobates quinquevittatus* (same clutch) some young frogs develop that are totally black while others have the colors of their parents. The black frogs develop their colors when they become adults". Has anyone else had a similar experience and if so, what are your thoughts concerning this phenomenon?

ERRATA

In the last edition of the newsletter there was a paper entitled The *Dendrobates quinquevittatus* Group - a Short Survey. The paper was written by Stephen Lotters of Bonn, West Germany. During the editing of the paper a change was made which gave the implication that Mr. Lotters was redefining the entire *quinquevittatus* group. In a subsequent communication Mr. Lotters clarified his intent, which was a re-definition of the species *Dendrobates quinquevittatus*. He states that his reason for making this redefinition is:

"Myers (1982) separated *D. fantasticus, reticulatus, captivus* and *vanzolinii* from the *D. quinquevittatus* complex of Silverstone (1975). Therefore, the definition of *D. quinquevittatus* (species) was no longer valid. I tried to make up for the lack of *D. quinquevittatus* (1988); Dr. Bohme suggested it be called a **re**-definition."

It should also be noted that in the legend to the map which appears on page 7 of Mr. Lotters' paper there is an error in the spelling of one of the names; *D. vanzolinii* appears as *D. vanzolinni*. This was a typographical error made by the editor.

Peruvian Dendrobatids Threatened by U.S. Coca Crusade!

J. K. Frenkel

Destruction of the rain forests inhabited by members of the genus Dendrobatidae in Central and South America takes many forms. Homesteading and development of pastures by an ever-increasing population, logging (especially clear cutting), expansion of industry, highway construction, and agricultural development including the cultivation of Coca. Recent news tells of plans by the U.S. Drug Enforcement Administration (DEA) to use Tebuthiuron, or Spike, against Coca plantations. A test on a coca field near Santa Lucia, in the upper Huallaga Valley of Peru (near Yarimaguas) proved successful. "Experiments with aerial application are planned. If they are successful, and if the U.S. government can resolve a dispute with the herbicide's producer, the first program of large scale eradication of coca plants may follow" (New York Times, June 28th, 1988, pages A1 and 8).

Probably at least seven dendrobatid species occur in the Huallaga Valley, where coca is planted.The effects of deforestation, to create coca plantations, on dendrobatids has not been studied to my knowledge. It is quite possible that most species (*D. quinquevittatus, reticulatus, fantasticus, vanzolinii, pictus, femoralis and trivittatus*) would loose their natural habitat, whether in trees, underbrush or leaf litter. The frogs would probably survive in remaining stands of forest.

The U.S. has previously applied defoliants and other toxins from the air against opium poppies and marijuana, but perhaps not against the more resistant coca. Spike is an agent that interferes with photosynthesis in a wide variety of plants. Spike is applied as a powder or pellets to the soil surface. Rain water moves the herbicide into the root system where it is take up by the plants. The herbicide is carried from the roots into the leaves where photosynthesis is disrupted. Unable to produce food, the plant dies as carbohydrate

reserves are exhausted. Spike is registered in the U.S. for the control of more than two hundred species of woody plants, broad leaf and green weeds. It is used for control of brush on pasture and rangelands, on airport runways, railroad right of ways, road shoulders, fire breaks and ditch banks, mainly for the control of unwanted woody plants. Spike is an odorless, non-volatile, white crystalline powder. It is stable and noncorrosive and has a solubility of 2500 ppm in water. Its half life in soil was found to be about one year in Louisiana and Indiana, and eighteen months in Arizona. Residues are usually confined to the top twenty four inches of the soil. Toxicity for mammals, birds, insects and fish tested was low, and the safety factor between highest concentration without effect and estimated maximum exposure levels was between 5 and 1000x. Velpar (DuPont) would be comparable to Spike in aerial application. Related compounds are Atratol (Ciba-Geigy), Banvel (Velsicol), Karmex (DuPont), Princep (Ciba-Geigy), Roundup (Monsanto) and Oust (DuPont).

The effect on Dendrobatids would most likely not be direct, but rather through destruction of their habitat. This would be worse with aerial application which might kill much of the remaining forest as well as the coca fields. It is difficult to apply chemicals with surgical precision from the air.

On May 23rd, 1988, Eli Lily & Company, the sole manufacturer of Spike, announced that it would not sell its product to the State Department for the coca eradication program. Currently the U.S. State Department is giving consideration to the idea of withdrawing Lily's patent so that the herbicide can be supplied by another manufacturer. They are also considering alternate products.

Peru appears to be willing to consider chemical eradication of the coca if it can be convinced that the herbicide is not harmful to other plants, animals and humans (New York Times). However, coca is said to account for approximately 40% of Peru's export income, amounting to about $1 billion dollars per year! An estimated 60,000 families are dependent on the coca cash crop. Wholesale eradication of coca would have serious local economic effects. This would no doubt be exploited by the notorious Shining Path guerrilla movement, a very radical Maoist

terrorist group recently becoming more active in Peru.

Bolivian officials said that they were unwilling to act as guinea pigs for experimentation with toxic herbicides (New York Times). The Environmental Protection Agency (EPA) is not responsible for ruling on the safety of products used outside the U.S..

Those who argue for aerial eradication point to the low toxicity of Spike ("less toxic than aspirin, nicotine, or other nitrate fertilizers"). They also state that manual eradication is to slow to be effective and that the narcotic traffickers pollute the rivers with kerosene, sulfuric acid, quicklime, carbide, acetone and toluene; all of which are used in the manufacture of coca paste and base.

Those who argue against aerial eradication emphasize that it would only add to the destruction of the ecosystem that is taking place by the ongoing slash and burn method of deforestation to plant coca, by removing further vestiges of forest and increasing erosion. In the past, when farmers lost their crops in the valley they cut down higher forest to plant more coca. We, in the U.S. must regretfully realize that in spite of the large amounts confiscated, our attempts to cut the supply of coca in Latin America is all to obviously unsuccessful. We must actively curb the demand within the U.S. if we ever hope to win the "War on Drugs". What price are we willing to pay, or to inflict on others, to deal with this problem?

Editorial Comment

I agree wholeheartedly with Dr. Frenkel in his assessment that the real issue in the drug problem is the demand for the stuff in the U.S.. It is hard for me to see the logic of jeopardizing the health of so fragile an ecosystem in such a dubious enterprise. With billions of dollars at stake the coca czars are not likely to be put off by defoliation of their fields when there are millions of acres of available land to grow new crops on. Can we defoliate the entire Amazon basin?

We (members of **ISSD**) should make a coordinated effort to ensure the survival of those species in question in our captive populations. I call on our members to produce as many specimens as they can of those species listed in Dr. Frenkel's paper (especially *Dendrobates fantasticus*, which is geographically restricted to

the Huallaga Valley) and to spread them around to as many experienced and successful breeders as possible. We should also attempt to obtain as many new wild caught specimens as possible. We are planning to develop a breeders registry, but its realization may be some time off in the future. In the mean time I think it would be good if we could find out just how many specimens of these species we have in captivity. Toward that end, I would like to ask you all to do two things. First, all those members having specimens of the species in question please send us a list (send it to Dale Bertram) and give us some idea of your anticipated captive production over the next year. With this data in hand we will be better informed when and if we embark on a campaign of lobbying to prevent this ecological disaster from happening. The second request is for the photos of specimens of the quinquevittatus complex that I requested for the Vivarium paper mentioned in the last newsletter.

Respectfully submitted:

Dale Bertram, M.D.

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Many thanks for the beautiful rendition of *Dendrobates quinquevittatus* that forms part of our new logo go to Gayle Westrate. Gayle is a fine artist, living in Southern California, who enjoys doing fine pencil renderings for commercial purposes as well as for private collections. She has a keen interest in nature. To contact Gayle please call Design West at 818-449-4077.

HERPETOLOGICAL CIRCULARS
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HERPETOLOGICAL COLLECTING AND COLLECTIONS MANAGEMENT

By
John E. Simmons

This 70 page handbook details standard and special techniques in field collecting and preserving amphibians and reptiles. It also describes museum collection management. It will be of use to any field biologists or systematists interested in reptiles or amphibians.

Single copies of this circular are available at U.S. $6.00 each including postage. Orders may be sent to Douglas H. Taylor, Dept. of Zoology, Miami Univ., Oxford, Ohio 45056